INVESTIGATOR'S ANNUAL REPORT

United States Department of the Interior

National Park Service

All or some of the information you provide may become available to the public.

OMB # (1024-0236)
Exp. Date (11/30/2010)
Form No. (10-226)

Reporting Year:	**Park:**	**Select the type of permit this report addresses:**
2008	Shenandoah NP	Scientific Study

Name of principal investigator or responsible official:	**Office Phone:**
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Project Title (maximum 300 characters):

How are arthropod communities affected by varying deer densities?

Park-assigned Study or Activity #:	**Park-assigned Permit #:**	**Permit Start Date:**	**Permit Expiration Date:**
SHEN-00351	SHEN-2008-SCI-0010	May 19, 2008	Dec 31, 2009

Scientific Study Starting Date:	**Estimated Scientific Study Ending Date:**
May 19, 2008	Dec 31, 2009

For either a Scientific Study or a Science Education Activity, the status is:

Continuing

For a Scientific Study that is completed, please check each of the following that applies:

__ A final report has been provided to the park or will be provided to the park within the next two years

__ Copies of field notes, data files, photos, or other study records, as agreed, have been provided to the park

__ All collected and retained specimens have been cataloged into the NPS catalog system and NPS has processed loan agreements as needed

Activity Type:

Research

Subject/Discipline:

Animal Communities / Wildlife

Purpose of Scientific Study or Science Education Activity during the reporting year (maximum 4000 characters):

High deer density negatively affects the understory vegetation (seedlings, saplings, shrubs) because of higher rates of herbivory and trampling. Lower understory vegetation can result in lower leaf litter accumulation, which may affect the microclimate (dryer and hotter) and the decomposing litter arthropods. Here we will quantify changes in nutrients flow, microclimate, arthropod community, and the responses of the bird community in forests with zero deer densities (exclosure) compared to areas with high deer densities

(outside the exclosures).

Findings and status of Scientific Study or accomplishments of Science Education Activity during the reporting year (maximum 4000 characters):

Ambient air temperature and relative humidity are recorded hourly. Leaf litter biomass is calculated from ten random samples at each 4 ha plot at the minimum (late summer) and maximum (late fall) leaf litter accumulation periods. Soil macro nutrients, including available nitrogen and C/N ratio are quantified from 9 random samples per plot. Bioassays of additional soil samples from the same location as the nutrient samples are used to quantify density and relative abundance of vesicular-arbuscular mycorrhizal propagules in the soil. Woody species â ¥ 1 cm diameters at breast height (DBH) are inventoried to quantify species composition, diversity, and relative biomass. The leaf litter arthropod community is surveyed from ten random non-repeating points within each 4 ha plot monthly from June - October 2008. Breeding bird census is conducted in each plot during the month of June through the first week of July in 2008 and will be repeated during the same period in 2009. Results for all surveys are pending further analysis.

For Scientific Studies (not Science Education Activities), were any specimens collected and removed from the park but not destroyed during analysis?

Yes

If "Yes", identify where the specimens currently are stored:

Arthropod specimens are stored at Towson University, Towson, MD.

Funding specifically used in this park this reporting year that was provided by NPS (enter dollar amount):	**Funding specifically used in this park this reporting year that was provided by all other sources (enter dollar amount):**
$0	$3500

List any other U.S. Government Agencies supporting this study or activity and the funding each provided this reporting year:

Paperwork Reduction Act Statement: A federal agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. Public reporting for this collection of information is estimated to average 1.625 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the forms. Direct comments regarding this burden estimate or any aspect of this form to Dr. John G. Dennis, Natural Resources (3127 MIB), National Park Service, 1849 C Street, N.W., Washington, DC 20240.